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ABSTRACT

This paper describes development and organization of educational resources in the Republic of Korea since 1970 and documents the activities of a team of consultants from Florida State University in assisting with that development. Project activities are reviewed, starting with the initial collection of information and data on the educational system, the economy, and national needs, and ending in a report of project accomplishments and recommendations. Throughout this time span the work of the consultants is reflected in educational models developed, learning experiences defined, and technological innovations tested. The reform of the elementary-middle school program, i.e., grades 1-9, was a primary concern for this project. Also reviewed are the activities of the Korean Educational Development Institute, which was established in 1972 in response to expanding programs and educational change. (RAO)

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EDUCATIONAL DEVELOPMENT: THE REPUBLIC OF KOREA

(1970-1979)

by

Robert M. Morgan

February, 1979

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ABSTRACT

In an effort to provide a better education for more of its citizens the Korean government has undertaken a number of steps since 1970. These included a major systems study of the nations educational programs in 1970-71. This study provided the basis for a major development effort and reform of the elementary-middle school system. In 1972 a national research capability--the Korean Educational Development Institute--was created to develop and empirically validate the proposed new system. Although there have been a number of changes from the system as it was originally conceived, KEDI has been at work building the new program for the past seven years. The latest large scale field tryouts (231,000 students in 1978) indicate that the new system--largely built on instructional system design concepts--is significantly more effective than the traditional elementary-middle school programs, and not more expensive.

EDUCATIONAL DEVELOPMENT: THE REPUBLIC OF KOREA

(1970-1979)

Robert M. Morgan

A Systems Study of Korean Education - 1970

The major aim of this study was an attempt by the Republic of Korea to find if it might be able to organize its educational resources in ways that would make its educational programs more responsive to the nation's needs and, simultaneously, function more efficiently than its present educational system. The general problem could only be addressed by answering a large number of corollary questions and the Korean government invited the Florida State University to mount a project for that purpose. In the planning phase of the project it was judged that a "systems approach" to the analysis of Korea's educational sector would be more suitable and a range of expertise and competence was identified as critical to the survey and analysis process. It was quickly apparent that the varieties of needed competencies would require an interdisciplinary team of specialists and the University assembled a study team of seven persons. The study team included (1) an economist; (2) a manpower specialist; (3) an educational administrator/manager; (4) an educational technologist; (5) a teacher training specialist; (6) a systems management specialist; and (7) a behavioral scientist. The project also utilized several American and Korean consultants as they were needed. The economist, a graduate of Seoul National University, was also a native Korean.

The study team spent three months in the Republic of Korea in 1970 gathering information and data about the educational system, the economy, the nation's needs and wants for its educational programs and the resources

available for potential improvement of the system. Prior to its arrival in Korea, the study team had identified several areas in which information was needed and the Central Educational Research Institute (CERI) in Seoul assembled an extensive inventory of historical data, research reports, planning documents and other relevant material. This preliminary work by CERI proved to be a great timesaver and added significantly to the efficiency of the study team. The early portion of the team's stay in Korea was devoted to identifying additional information requirements and more carefully formulating the questions that needed answers. CERI and the Ministry of Education then worked with the team in identifying the most appropriate sources of information and answers to the questions. At times during the period in Korea the study team operated as a whole, but more often the individual members of the team worked separately with counterpart Korean specialists. Before the three months were over members of the study team had visited schools at all levels throughout Korea and had talked to hundreds of teachers, school administrators and students. The team also worked closely with several Korean government agencies, most particularly the Ministry of Education (MOE) and the Economic Planning Board (EPB). By the end of the team's stay in Korea a great deal of information had been gathered, which the team then began to sift, organize and analyze.

Clearly, the study team could not in the few months available become in-depth experts in the social, economic and educational affairs of the Republic of Korea. However, a great deal was learned. From what was learned the study team formed certain impressions, developed conclusions and made some rather sweeping recommendations for educational reform in Korea. The team recognized that there was a danger of incompleteness and even inaccuracy in so hurried an information collection, but judged the available data of sufficient validity to justify its conclusions and recommendations. There were some errors or

data gaps in the study that were apparent to the experienced Korean educator when they reviewed the study. Korean government officials, educators and researchers determined that these errors did not significantly effect the conclusions and recommendations.

In the study and analysis, focus was on those issues which would help the Korean Republic provide a better, more relevant education for more Korean young people at a lower unit cost and at a total cost not greater than the nation could afford. To this end, the study team collected historical, cultural and educational data, including demographic reports, economic forecasts, manpower needs projections, educational fiscal data, current and long-range educational plans and such information as was available on educational objectives and attainment. The data was analyzed in terms of future manpower needs and educational output, estimated cost benefits, and strategies for appropriate introduction of innovation and technology into the educational system. Alternative approaches to relating resources to educational objectives and problems were examined.

Economic Factors

In the post-Korean Conflict period, the Korean economy had experienced remarkable industrial progress and growth. There seemed to be general agreement among economists, both Korean and foreign, that the economy would continue to grow in the foreseeable future, would become somewhat more stable and would lead to an improved balance of payments position. The labor force was inceasing steadily and the rate of unemployment was decreasing. All indications were that in general business would be good but in an economy as dynamic as that as Korea, economists did not appear to be able to predict very many years in the future nor with much specificity what that business would consist of.

It seemed unlikely that manpower needs forecasts that extended more than two or three years into the future would be of much validity--particularly at the technical and subprofessional levels. Yet, it was at these levels that Korea was likely to develop its greatest manpower deficiencies which would be qualitative rather than quantitative. At that time in Korea, it was not unusual for a job holder to have an education which was largely unrelated to the particular job functions performed. Furthermore, manpower waste through over qualification of incumbent job holders could be observed and was anticipated to increase. A major problem was likely to result in the future from the lack of congruence between the nation's manpower requirements and the projected supply of skilled labor, subprofessionals and technicians. It was suggested that the only long range solution to these problems was a reordering of the educational priorities in the schools of Korea.

In recent years, the burden of financing public education in Korea had increasingly moved to the federal government and away from the private citizen, though the private citizen was still a heavy contributor. The formal educational system of Korea had become, to a large extent, a publicly controlled service. It was noted that purely in terms of economic needs, the quantity of schools may be sufficient for the next few years, but the quality of human resources produced by existing middle and high schools can reach neither the level for which purpose these institutions are intended nor that required for the nation's employment needs. The study team contended that investment in education is as important to economic development as investments in physical capital. As investment in education competed with investment in physical capital in the allocation of scarce national resources, it was prudent for Korea to invest relatively more in the middle schools than in the higher levels of the educational system. Two rate of return studies were undertaken in this

project, which indicated that for the high school level, the rate of return (11.2%) was not much different than that for the college and university graduates (9.5%). The rate of return for the middle school education, however, was noticieably higher (20.0%). This latter rate of return was, in fact, higher than that for the average capital investment in Korea at that time.

There were important implications of these economic and manpower considerations for governmental and educational decision-makers in Korea. The greatest needs for manpower in the years ahead would be at the level of the middle school graduate. The rate of return on investment was astonishingly high at this level. The educational programs through the elementary and middle school were not as appropriate to the future economic needs of Korea as they could be. Using economic criterion such as earnings, employment and maximizing economic benefits, one concluded that the expansion and improvement of the elementary and middle school programs should have been given high priority. There were also social and humane arguments to support this contention.

The Contemporary Korean School System

The educational goals that characterized the Korean elementary and middle schools appeared to be restricted to the conventional academic domain. The student learning outcomes at these levels fell almost exclusively into the informational and skill categories of educational objectives. Students were acquiring the skills of reading, writing and computation, though with variable proficiency. This system seemed to be characterized by rote memorization of classically academic subjects with the overriding objective being to prepare the student for the national competitive examinations.

These exams were used to select those students who would be permitted to enter the next level of education. The exam for entrance to the middle school had been eliminated recently, but the study team did not see evidence that this action was having any positive effects on the curriculum. The existing curriculum was not as relevant to preparing Korean children to live and prosper as adults as it could have and should have been . The study team did not attempt to specify educational objectives. This could only be done by Korean educators. However, the team felt the curriculum could be broadened to include the teaching of inquiry skills, problem solving approaches and generally attend more to process objectives--and that these should not only be learning outcomes, they could also serve as effective instructional means. A general addition to the elementary-middle school curriculum and important to the enhancement of its relevance, would be the addition of preoccupational education. It was suggested that a properly conceived preoccupational program would add to the graduate's employability, his retrainability and his occupational mobility. In other words, the products of nine years of education in Korea could grow into a valuable inventory of manpower which with limited but specific additional training could be prepared for technical and skilled occupations as these needs develop and change.

The study team predicted that the present Korean educational system could not in its existing form achieve these important objectives through simple expansion or minor alteration of the existing system. An additional problem was that with 6.7 million children in school in the age range of six to fourteen years, nearly a million youngsters were out of school. By 1975 there would have been 8.2 million Korean children in the eligible age range for the elementary and middle schools. There are many reasons--manpower needs, societal stability and humanitarian--that led the study team to conclude that it was

essential to expand free, universal education to include the middle school level. It was noted that free education as it is understood in the United States did not exist in Korea except for a few, very poor families. Almost all families contributed directly, through purchase of textbooks, tuition and various fees, to the cost of educating their children. When these hidden contributions to school operations were added to the visible tax contribution, the per student per year cost was estimated to average 12,878 Won for the elementary and middle schools combined.[1]

A Proposed New Educational Model - 1971

In order to develop a nation of people, all of whom had been prepared for a life of fulfillment in terms of general occupational and citizenship education, the study team suggested in its report that a nine-year, free and compulsory educational program was necessary. If the public schools through the ninth year were open to all students, were free and of uniformly high quality, it was reasonable to assume that the need for private schools and out-of-school tutoring would virtually disappear. It was also reasonable to assume that funds used for these purposes would be diverted to public school support, though in the form of public school taxation.

The vocational high schools of Korea, which enrolled slightly more than half of those students permitted to enter high school following graduation from the middle schools, were not, in the judgement of the study team, effectively serving the purposes for which they were formed. Based upon assumptions about the potential for improved academic accomplishment at the elementary

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[1] All Won figures in this report are based on 1969 values. The exchange rate at that time was approximately 370 Won to the U.S. dollar.

and middle school level, the study team recommended that responsibility for all post-ninth grade occupational training be consolidated under a single governmental agency and that this training should have been directed exclusively to preparing people for specific jobs. These job training programs would have been of variable duration depending on the training requirements, would have been operated only as long as there were known manpower needs for the jobs in question, and would be open to qualified citizens of any age level. It was suggested that the vocational high schools of Korea should become an integral part of the job training program and cease to operate in their present form.

The study team recommended that the Korean colleges and universities and the academic high schools that feed them be maintained at their present rate of growth and improvement measures of an evolutionary and gradual character be undertaken in the future. These improvement measures would be of the kind ordinarily expected in the normal course of events. Based on projections of the Ministry of Science and Technology for manpower needs at the higher levels--scientists, engineers, professional managers--the Ministry of Education would need to reappraise the enrollment quotas for the various subject areas in the universities.

The highest priorities for extraordinary change and development for Korea should have been at the elementary-middle school level. It was believed that through a substantial, but feasible, effort in the development and validation of a significantly different kind of elementary-middle school that Korea could provide an educational program of demonstrably higher quality and relevance for all age-eligible Korean youngsters. Further, it was predicted that this program once developed and installed in the nation's schools would not only be cost effective, it would in fact cost less per student to operate than was

presently the case.

The new school proposed by the study team involved a number of changes from the existing system. These included changing the basic instructional unit from its present class size form to a larger grouping, introducing individualized instructional concepts and associated materials, modifying the role of the teaching staff and increasing the ratio of students to teachers, and using programmed instructional television and radio.

It was proposed that the students would be organized into "instructional units" of 300 students with the average sized Korean school having three such units. Each instructional unit would become the responsiblity of a four person teaching team whose functions would be differentiated and carefully defined in terms of what each team member contributed to the learning experience of the students. This would raise the student-teacher ratio from the present 55-1 to 75-1. It was proposed that the instructional unit (with 300 students and four staff members) would have permanently assigned to it six conventional classrooms. This would make an average student-to-classroom ratio of 50-1, down from the present 66-1. In order to get the learning group into sufficient space, the Korean government would face a socially and politically difficult decision, that of moving their schools to a double shift basis. Because of the self-study nature of much of the planned educational materials, the students would have been able to do more learning in their homes or out of school. It should have been possible to shorten the time in school for students without reducing real instructional time or learning achievement.

A basic recommendation of the study team was that the Korean elementary-middle schools be moved to a system of individualized instruction. The introduction of an individualized approach should have several benefits. It was performance based, permitted students to move at their own learning rate,

and placed a larger measure of responsibility on the student for self-direction of his learning experiences. It also reduced reliance on direct teacher-to-student instruction. The basic instructional resource for that portion of the curriculum to be individualized was a "student-learning unit," which was prepared in modular and overlapping form and was packaged for ease of storage and retrieval by students. These units should have been sufficiently durable to have a use-life of four to five years. The student-learning unit contained the behavioral objectives for the unit, critical instructional materials and directions to other resources not contained in the package, and formative criterion-referenced test items which permitted the student to assess his own progress through the unit. The principles of programmed instruction were employed in the development of these units even though most of the instructional materials were not programmed instruction per se.

Another feature of the proposed program was that the teaching staff should be differentiated in a manner that calls for professional staff with differentiated specialties. This provided a better means for having the full range of competencies available in the instructional unit and made it possible to allocate different responsibilities to the individual professionals making up the team. The team functions must derive from an empirical analysis of the new learning program and required special training be given to the teaching team. The teaching team would operate under the direction of a master teacher whose main job was the management of the learning environment.

The study team proposed that a national educational radio and television distribution system be developed which would continuously transmit instructional programs during the school day. It was estimated that one and one-half to two hours of television instruction would be received by each student each day, comprising about one-third of the student's instructional day.

The type of television suggested was one which couples the principles of programmed instruction and good dramatic television production to yield programs which are interesting and will teach youngsters who are widely varied in age and socio-economic background. Television sets could be made available, programming and maintenance capability existed, and a working prototype for central transmission and nationwide relay was in place. It was estimated that a functional national educational television system could be built and installed including a television set for each instructional unit of 300 students plus an inventory of replacement sets for maintenance rotation. This television system would be an integral component of the system of instructional resources and would not be an "add-on" to the existing instructional program. It would be a form of programmed instruction developed to teach specific behaviors and would call for active responses from the student. Auxillary printed materials would be developed to go with the ITV programs in which the students would write responses, solve problems and record reactions and questions. Student learning would be closely monitored and the teacher would be furnished supportive and supplementary materials to help her work individually with any students who experience difficulty or who fall behind in the televised instruction.

In the proposed Korean elementary-middle school it was anticipated that radio instruction would be used in the context of the individualized program and be one of the instructional resources to which the student was directed.

These were extensive changes recommended by the study team in the educational processes for the Korean elementary and middle schools. Deciding upon the appropriate educational goals and operationally defining them into specific instructional objectives was a task of enormous importance to the future of Korea. The kind of individualized program being recommended by the

by the study team would work best if continuous progress of each student was permitted.

Vocational Education

The part of education about which Korean leaders, both governmental and educational, invariably expressed the greatest concern was vocational preparation. The study team strongly recommended the addition, at both the primary and middle school levels, of a substantial offering in pre-occupational preparation. The learning of the specific technical job skills needed in Korea's economy could then be readily acquired on a minimum training time basis. The graduates of the proposed nine year curriculum should have solid academic preparation and should also be well grounded in the general fundamentals and prerequisites to specific job training. These changes will make the vocational-technical high schools as they have traditionally operated obsolete and unnecessary.

What would be needed was a system of job training programs which would have the following characteristics:

A. The training would be exclusively related to specific jobs that would be available as students complete the training. Manpower needs forecasting would be essential for these purposes.

B. The program, growing out of short range (two years or Less) manpower needs predictions, would be of variable duration, the training being no longer than is minimally required to prepare the trainees for the available specific job. These programs would vary from four weeks to two years in length.

C. The system would provide for the start up of new training programs, with the shortest possible lead time, as needs change. By the

same token, programs would be terminated as they were no longer needed.

D. These programs would be staffed with personnel who knew the job skills being taught, with much less emphasis on degrees, teacher certification or other formal educational requirements.

E. These schools would not only train middle school graduates; they would be used for retraining of adult employees as personnel needs change.

F. There would need to be a very close liaison and coordination between the appropriate governmental agencies and the private sector to maintain the optimum relationships between training output and manpower utilization.

Evaluation

To optimize the adoption, effect and continued improvement of these innovations, it would be necessary to develop an efficient appraisal and evaluation activity which would provide policy-makers and public in general with information about the achievements, and problems which resulted from these innovations. Information for this evaluative function should be derived from the performance of individual students and various groupings of students, and at the component level, it must come from the performance of the various educational components which comprise the innovative pattern being proposed. Only by covering the range of information from the student to the component would the public and educational decision-makers be able to know the effectiveness with which the educational system was performing.

The purpose of evaluation was to provide information which would permit the continuing improvement of the educational process. Its scope should be

system-wide, with a comprehensive role for evaluation at each level, ranging from tracking the progress of the individual student to assessing the performance of the total system on a national scale. Evaluation should be based on systems performance with respect to the defined goals and objectives for Korean education. With education conceptualized as an input-process-output model, the data base for the evaluation system would be described in terms of the corresponding sets of data comprehensive evaluation of the developmental effort, therefore, would provide descriptive and diagnostic feedback for the planning and development, implementation, operation, and diffusion levels. Emphasis would be placed on evaluation at the student level, the component level, the school level and the system-wide or national level. The basic purpose of this evaluation would be to provide adequate, valid and reliable information on performance assessment at each level so that the highest performance possible may be reached under the existing constraints. To create such a comprehensive evaluation system required a series of activities. The first of these was a thorough review of the nature and intent of the evaluative systems currently in operation in the Korean educational system. The second was to expand the evaluation model outlined in the study team's report into a detailed operational plan which is appropriate to Korean education, to the innovations being implemented, and to the formative requirements of these. The third step was the general process of testing and validation of the evaluation model. The fourth step was widespread implementation of the evaluative procedures. This evaluation system would help bridge the transition between the current system and the installation of the proposed system and facilitate it.

Development and Implementation - 1972

Korean educational leaders concluded that the kind of elementary--middle school proposed by the study team was sensible for the nation and appeared to be a desirable and viable alternative to the present educational condition. They have had to address several other important questions. The responsible government officials have had to judge whether or not the proposals that appear to be good for Korea are also possible. Are the various resources--people, money and time--available? What are these resources? How long would it take to develop such a system? How much would it cost to develop; how much to install nationwide; then how much to operate on a yearly basis?

The study team was optimistic that the key resource was available. This resource was a group of aggressive, technically sophisticated Korean educational researchers who were prepared to spearhead the effort. Additional support and technical staff needed to be prepared and this appeared to be feasible. These resource personnel needed an organization, under the Minister of Education, which would be funded and mandated to undertake the development and validation of the new system. The study team proposed an organization which it labeled the Korean Educational Development Institute (KEDI) whose responsibilities should include the design and tryout of the system and its components. With personnel from the MOE and representative Korean educators KEDI should reappraise the educational goals and objectives for the elementary-middle schools. It should develop definitions of desired learning outcomes at the various levels and then design and build the instructional programs to achieve these outcomes. These instructional resources--student learning units, ITV, radio and teacher directed activities--should be chosen in terms of their appropriateness to particular content and objectives in the curriculum. KEDI should be responsible for empirically demonstrating the instructional effec-

tiveness of these new programs of learning, and should plan and develop a comprehensive educational evaluation system. The evaluation system should provide for assigning responsibility for student learning to the principal elements in the educational program, should provide for periodic audit of performance, and should permit system accountability.

The study team recommended that a three phase effort be undertaken: (1) development; (2) tryout and revision in a pilot community; and (3) nationwide dissemination. It was imagined that KEDI could best achieve the first two phases as well as continued improvement of the program through research, while the operating bureaus of MOE were best equipped to take responsibility for the third phase.

The recommendation was made to build and try out the new educational system in a single province but the developers should keep in mind that eventually the system would be used nationwide and they were designing to that end. Estimates were that it would take approximately four to five years to build and install the new system in a pilot province. Nationwide diffusion during the development phase could probably be accomplished in the same length of time, if the decision to go nationwide had been made at the onset of the program. However, by deciding to take the program nationwide only after the pilot system became operational (as the study team recommended), then an additional one to two years were required for national diffusion. The cost of development and installation on a national scale was estimated to be approximately $17,000,000.00, while the same program installed only in a single test province was estimated to cost approximately $7,500,000.

The per student annual educational cost for the new system was estimated to be 9,819 Won. This would require an annual educational budget for the Korean elementary-middle schools of 80.5 billion Won if the 8.2 million age-

eligible Korean children were all enrolled in the public schools in 1975. This is contrasted with the 104.9 billion Won required for the same number of children at the 1969 per student expenditure rate.

The Korean Education Reform 1971 - 1977

The study team report with the recommendations summarized in the previous section was delivered to the Korean government in February of 1971, and seven years have elapsed since then. Although work on the proposed educational reform is still in progress enough has been accomplished to justify a summary of the activities to date.

The report was immediately submitted by the Korean government to intensive and critical review by key staff members of the Ministry of Education, the Economic Planning Board and educational leaders outside the government. Robert Morgan, the FSU study team leader, returned to Korea in April, 1971, to participate in this review process. As might be expected from such an exhaustive analysis a number of errors made by the study team were revealed and some conditions were noted to which the team had not given appropriate weight. However, these problems were not thought to be sufficient to invalidate the essential recommendations of the report. Following the reviews, with reactions both pro and con, the Korean government decided to undertake the reform program.

In terms of the Korean educational program the report included two broad targets of reform: the elementary-middle school program (the grades one through nine), and the post-ninth grade vocational educational program.

The decision was made to undertake the revision of the elementary-middle school programs at once deferring until later, action on the vocational educational programs. Clearly, this was a step of enormous importance to

the Republic of Korea and one which would engage them for several years in a highly complex developmental effort. It was anticipated that the development and tryout of the new elementary-middle school curriculum would require six to seven years before it would be ready for implementation nationwide. During this projected time period a great many things would have to be accomplished. A sophisticated educational development resource would have to be chartered, staffed, housed and funded. Money for the project was to be secured through an international loan agreement but it was expected that the loan would take nearly a calendar year to negotiate. If the project was not to be delayed for a full year while waiting for loan funds the Korean Government would need to provide interim financing for project start-up.

The first concrete action which followed immediately the public announcement of the planned reform, was the creation by the Minister of Education, Dr. Kwan Shik Min, of a small nucleus group to proceed with the detailed planning efforts. Professor Yung Dug Lee, of Seoul National University, was designated the chairman of this task force and was temporarily detached from the University to the Ministry of Education. Florida State University was asked by the Korean Government to loan Morgan to the MOE from June, 1971 to September 1972 to work with the task force.

In Figure No.1 is shown a flow chart developed in 1971 by the Task Force identifying the major events in sequence which needed to be accomplished in the first eighteen months of the project.

Temporary space and funding was allocated to the Task Force and in a short time it grew to six senior professionals recruited from Korean Universities and research institutes. Wtih a small support staff the Task Force began its work. The FSU report was a general statement of Korean educational problems and relatively broad-brush descriptions of possible responses to these problems.

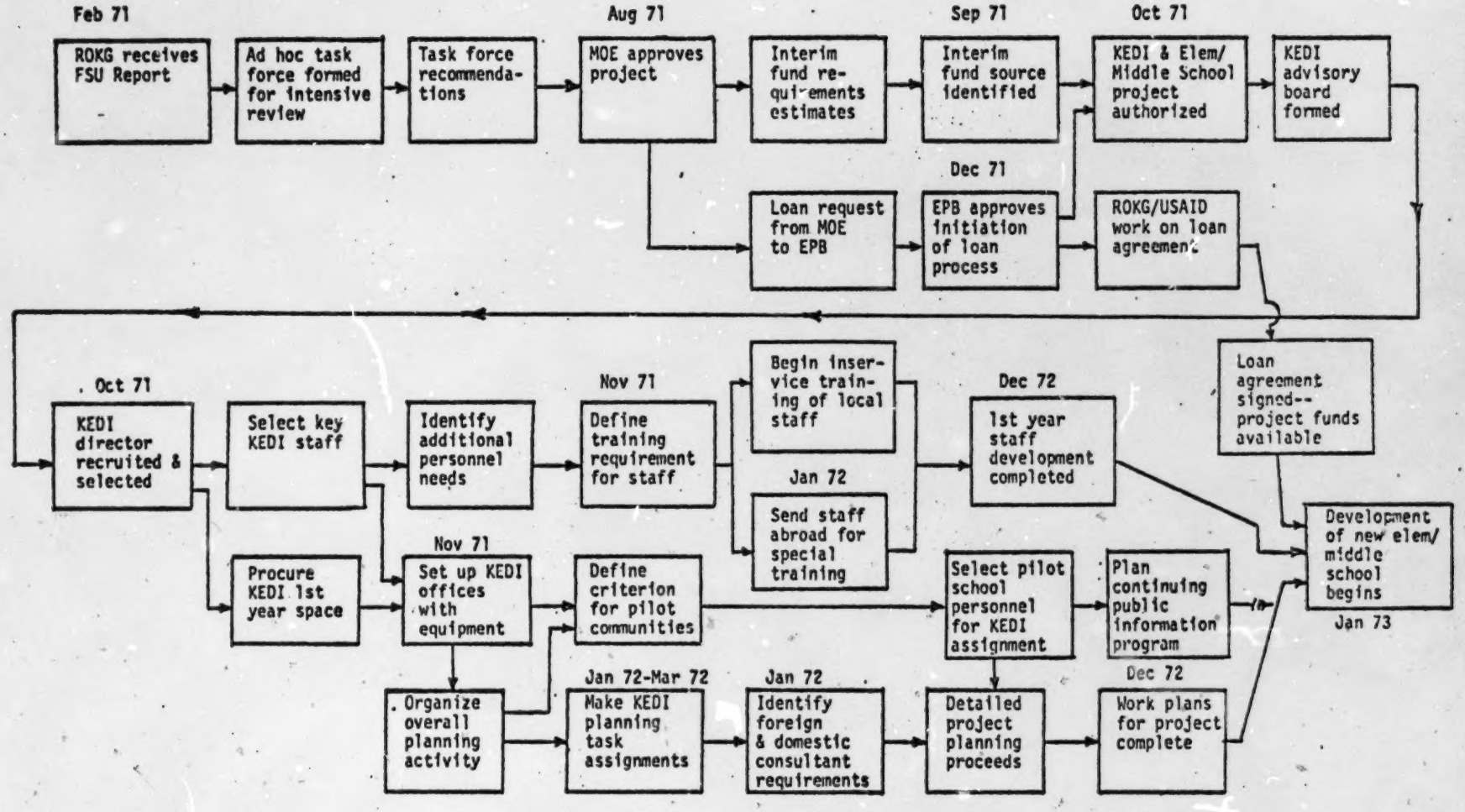
Feb 71
ROKG receives FSU Report
Ad hoc task force formed for intensive review
Task force recommendations
Aug 71
MOE approves project
Interim fund requirements estimates
Sep 71
Interim fund source identified
Oct 71
KEDI & Elem/Middle School project authorized
KEDI advisory board formed
Dec 71
Loan request from MOE to EPB
EPB approves initiation of loan process
ROKG/USAID work on loan agreement
Loan agreement signed--project funds available
Oct 71
KEDI director recruited & selected
Select key KEDI staff
Identify additional personnel needs
Nov 71
Define training requirement for staff
Begin inservice training of local staff
Jan 72
Send staff abroad for special training
Dec 72
1st year staff development completed
Development of new elem/middle school begins
Jan 73
Procure KEDI 1st year space
Nov 71
Set up KEDI offices with equipment
Define criterion for pilot communities
Select pilot school personnel for KEDI assignment
Plan continuing public information program
Organize overall planning activity
Jan 72-Mar 72
Make KEDI planning task assignments
Jan 72
Identify foreign & domestic consultant requirements
Detailed project planning proceeds
Dec 72
Work plans for project complete

Figure No. 1
Activity Flow Sequence for Elementary-Middle School
Educational Development Project (Feb, 1971 - January, 1973)

It was an impetus for reform not a detailed blueprint for action.

The first priority the Korean task force set for itself was the development of a complete plan for the management of the reform project. They estimated the number of instructional hours for which materials of various kinds would need to be developed. For all the subject areas for the nine grade levels teaching materials for nearly 8,000 hours of instruction would be required. This included instructional television, the multi-media mastery learning units, texts and workbooks, and teacher guides. Development groups in other Korean research institutes had some experience in these kind of activities and they assisted in the calculation of the numbers of people and the different specialities that would be required to complete the work in the alloted time period. From this analysis it was estimated that the development group would need to consist of approximately 300 people--professional, technical and support personnel. Among this total complement of manpower a wide range of competencies were represented. Writers, editors, photographers, ITV producers and technicians, instructional designers were only a few of the critical for which experienced people had to be recruited or new people had to be trained.

An outgrowth of this effort was the beginning definition of the organizational structure of the planned Korean Educational Development Institute which had been described in the FSU recommendations. Other by-products included early projections of office, laboratory, studio and other space requirements, as well as the needs for generic and specialized equipment. The Program Evaluation and Review Technique (PERT) was used in this early stage to show how human and material resources would need to be orchestrated in time to insure the success of the E-M project. Also revealed at this stage were the first projections of financial requirements by month and year for the life of

the project. A reasonably accurate estimate of cash flow and total money needed was essential for purposes of national budgeting and was a prerequisite to the completion of the international loan agreements.

Parallel to this process of man-loading the project was a nationwide survey of human resources with requisite skills and experience which could be employed to work on the project. A comparison of the numbers and kinds of people who were available confirmed the earlier judgement by the study team that twelve to eighteen months of training time would be required to prepare a sufficient staff. There were enough people identified to begin staffing KEDI, particularly in the most senior professional, managerial positions. At this point some of these senior people were employed by the Task Force and the Task Force gradually began to function as the leadership staff of KEDI-though the Institute had not yet been incorporated by the national assembly. Late in 1971 Dr. Yung Dug Lee was selected by the Minister of Education to serve as the Director of KEDI.

During the last quarter of 1971 the KEDI staff focused on two major activities. These were: (1) an intensive series of meetings, conferences and presentations on the E-M project and KEDI, held with teachers, school administrators and boards, lay groups and representatives from the public media; and (2) the writing of the international loan agreement in cooperation with the Ministry of Finance and the Economic Planning Bureau. The first of these activities was essential to broaden the base of support for the reform effort, respond to questions or criticisms and to secure the cooperation of educators throughout the nation. Very little public disclosure of the nature of the E-M project had been made prior to this time, though the systematic publication of all aspects of the project to all levels of Korean society has been an important continuing process since the early part of 1972.

In late February, 1972, a series of events occurred which threatened to seriously jeopardize the entire project. By this time the loan agreement between the U.S. Government and the Republic of Korea was in the final stages of negotiation. The threat resulted from a small group of Koreans, who, for variety of reasons were opposed to the reform project. This group gained access to the Korean President, Chung Hee Park, and asserted that the project represented a danger for the Republic and would be less effective and more costly than the existing system. As a consequence the President ordered all project activities halted until the project could be thoroughly studied by a special Presidential Commission which he appointed. The Commission, made up of leading citizens, educators and government officials who had not been previously involved in the project, undertook an intensive review of the reform plan hearing from professional educators, government officials and any other Koreans who could contribute to their judgement. These hearings lasted for several weeks, with all points of view being heard, before the final recommendations were made to President Park. The Commission recognized that certain risks were involved--as in any major change effort--but they judged the project to be soundly conceived and that the potential benefits to Korea far outweighed any associated dangers. The various allegations about the reform plan were judged to be unimportant or without substance and the President was advised to let the work proceed--which he did. A salutory side-effect of this interesting episode was that many key people, including the President and the Prime Minister, had achieved a thorough understanding in all that was involved in the proposed reform. This depth of understanding by the highest level Koreans was to pay dividends for the project in the years ahead.

On July 31, 1972 the Korean National Assembly approved the international loan agreement for the educational development project and one month later,

August 30, 1972 the Korean Educational Development Institute was officially registered as a special foundation. While there were still a few legal loose ends to tie up, for all intents and purposes an enduring, sanctioned organization for educational change had been created. A board of directors was designated who quickly confirmed Dr. Yung Dug Lee's appointment as KEDI's first director.

While the raison d'etre for KEDI--at least at the beginning--was the conduct of the Elementary-Middle School project it was expected that it would also serve other purposes for the Ministry of Education. The Project Loan Proposal states four broad aims of the Institute.

KEDI Purposes:

1. To determine educational ideals and objectives which reflect the cultural heritage, social reality and future direction for the Korean society.
2. To reformulate and systematize educational content to correspond to educational objectives.
3. To develop and utilize modern educational methods, facilities and materials to achieve an effective and economically efficient program of education.
4. To establish a comprehensive research and development agency to assist the Ministry of Education in formulating educational policy for the nation.

These statements indicate a considerably broader purpose for KEDI than just the E-M project and activities of the Institute since its start-up has reflected these broader purposes. KEDI has inaugurated a "High School of the Air" program which allows out of school adults to continue their high school education through radio instruction in cooperation with participating local high schools. KEDI has also been funded to develop special curriculum

in the area of population education. It has and is participating in several other similar kinds of projects at the request of the MOE which are worthy contributions to educational change but are only peripherally related to the E-M project.

Still the Elementary-Middle School project is the main driving force of KEDI and much work has been completed on that project. For the first couple of years the attention of the KEDI leadership had to be focused on institution development. This took longer and was more difficult than any of the original planners had anticipated. KEDI entered into an agreement with FSU for help with their staff development and for on-call technical assistance. Clearly one of the most urgent needs of KEDI was to rapidly train and expand its professional staff.

Since 1974 the curriculum and instructional development effort has represented the main activities of KEDI on the E-M project. Principal areas of activities include:

1. Development and tryout of new instructional delivery models including classroom, media and management considerations.
2. Development of instructional materials and programs (print, ITV and radio) compatible with MOE curriculum and suitable for the new instructional delivery system.
3. Construction and operation of broadcasting and transmitting facilities for television and radio.
4. Experimentation and evaluation.
5. Development of teacher-training programs and materials; training of participating teachers and administrators.
6. Development and maintenance of a network of contacts and communication linkages at provincial and local levels.

Field Validation and National Diffusion - 1978-79

As the project has matured and the KEDI leadership has gained experience many changes in the original plan of action have been made. The systematic emphasis of the FSU study appear to have survived but many of the specific strategies for implementation have been modified--sometimes substantially. The E-M project called for several major changes in Korea's elementary and middle programs. While the strongest rationale in 1971-72 for the reform was in the cost area, this was soon reduced as a priority by KEDI and the Ministry of Education. One reason for this shift was the Korean economy and its growth during this period. The FSU report had projected a continuing shortfall in the possible school enrollments based on Korea's predictions in growth rate of its GNP from 1970 to 1978, assuming that the share of GNP allocated education would remain relatively constant. The report also anticipated a continuing shortage of teachers. Both of the predictions missed the mark. GNP grew at a much higher than predicted rate and more teachers were trained and available for classroom assignment than had been expected because of substantial increases in salaries. With a fairly large increase in per capita GNP there was simply more absolute money available to support education, even though the relative amount remained about the same.

There are two consequences of this: (1) Korea has been able to enroll nearly 90 percent of the age cohort in the first nine years of education and expect to make attendance for elementary middle school education compulsory and available for all in the early 1980s. (2) KEDI, relieved in large measure of the numbers problem, could concentrate on the E-M project in improving instructional efficiency and content relevance. With the reduced pressure to save money, some of the more politically and socially troublesome recommendations

of the FSU report were abandoned early in the project. These included double-shifting of schools, differentiated teaching staff functions, and grouping students into larger learning groups. ITV and instructional radio have also experienced a major change in their respective roles in instructional delivery, but for different reasons. It was originally intended that they would be an integral part of the daily instruction of all students, and indeed, the instruction delivered by ITV and radio would not be given any other way. In other words, ITV and radio were to have been a critical part of the instructional delivery system. These elements had been included in the proposed instructional repertoire to contribute both to cost-saving and improvement in the quality of instruction.

The Korean government entered into a contract with the Tethered Communication Corporation (T-Com) of Westinghouse in December, 1972 for the purchase of a TV and radio broadcast transmission system to be installed in the north central part of the country. KEDI built a 27,050 square meter facility to house and support the T-Com transmitting operation. The T-Com transmitting system included a helium filled tethered balloon flying at an altitude of 10,000 feet to which transmitters are affixed. It was planned for KEDI's ITV and radio programs to originate at the main studios near Seoul, be relayed to the T-Com transmitters carried by the balloon on a C Band microwave link and be retransmitted to television and radio receivers in school classrooms. Two UHF channels were dedicated for ITV and one FM channel for radio. This first site was to have been one of a two phase operation. The second phase would have seen a second balloon installed in the southern part of the Republic and the two sites together would have distributed an acceptable signal to the entire country, including the off-shore islands.

This aspect of KEDI's project was fraught with technical problems from the onset, both in terms of the aerodynamic stability of the balloon and the quality of the signal. After a few trial broadcasts in late 1975, the technical problems were judged insurmountable in the Korean climate. The system was declared unworkable and the site was dismantled in 1977 (Masoner, 1979).

During the same period KEDI had completed the installation of its TV and radio production studios and many lessons using these media had been produced. KEDI made the decision to develop a groundbased microwave relay system when the T-Com technology was abandoned. Such a system would parallel the existing microwave relay system presently owned and operated by the Korean Broadcasting System (KBS) under the jurisdiction of the Ministry of Communications. In early 1979, discussion were still underway in Korea as to whether responsibility for the educational transmission network would remain with KEDI and the MOE or be assigned to KBS and the Ministry of Communication. However this decision goes, it seems certain that there will be a nationwide broadcast network dedicated solely to educational programs, and that KEDI will retain programming, production and scheduling control, even if it does not own and operate the transmitter system.

While the T-Com Corporation indemnified Korea for its financial losses in this venture, the time lost by KEDI cannot be replaced, nor can the credibility it lost with the Korean public, as a result of promising national color television broadcasts which it has been unable to deliver.

Because of the failure of the tethered balloon transmission system bought from Westinghouse it was impossible for KEDI to build a reliance on the ITV and radio components during the devleopment period. The instruction to have been provided by ITV and radio had to be given in other ways, using teachers and

instructional materials which could be made available to remote schools. While a great many instructional programs in ITV and radio were developed by KEDI--and most of these were tried out in classrooms on a fragmental basis--the new instructional system neither depended upon them nor provided for their inclusion as an integral instructional element. It now appears these programs will be broadcast as adjunct to the new teaching system, rather than as an essential part of it.

What then remains of the ambitious reform project started in 1971? As it turns out, a great deal remains and probably all of the truly essential concepts have been preserved. KEDI seriously addressed the task of analyzing the existing curriculum and the educational needs of Korea's citizenry and systematically identified the places where the curriculum was not sufficiently responsive to these needs. It then developed relatively inexpensive instructional materials and student learning evaluation instruments which articulated with those text and other materials already in common use. It devised a teaching/learning process which could be managed by the existing teaching personnel and school administrators. It then devised teaching guides and intensive training programs for teachers and administrators to prepare them to function effectively as the orchestrators of the new instructional programs.

Finally, they conducted an iterative series of validation tryouts of the new instructional elements and the elements in aggregation. These field tryouts were started in May, 1973 and only 745 students from two schools in Seoul were involved. There were two subject areas--mathematics and science--in the third and fifth grades which were tested. This test, the first of several, was the means of formative evaluation and feedback of the new instruction. It told the KEDI developers what needed to be changed in the materials and processes tested

and provided a basis of experience for future development. The indicated changes were on the basis of how effectively the programs caused children to learn. It was the beginning of a competency based program of student learning.

During the successive demonstration tryouts KEDI learned a great deal about areas where remediation materials were needed for some students and enrichment programs were needed for others. Student learning data suggested areas for individualized or self-teaching and pointed up those areas where teacher directed group instruction was most appropriate. Most important, the teachers and students know, on a daily basis what the desired learning outcomes were and had a means of assessing progress toward these ends. The latest tryout, completed in 1978, included 231,567 students in the first six grades of 231 schools from throughout the nation. All subject areas were included. Student achievement data, student, parent and teacher reaction, and process efficiency data were collected from both the tryout schools and a comparable sample of control schools providing conventional instruction. As of the writing of this paper the massive array of data collected during this tryout has not been completely analyzed but the results on all of the major variables significantly favor the new program. In the several tryouts--four small scale and four large--since 1973 the achievement levels have generally been higher for the demonstration students than for the comparison group. As a rule, the achievement differences between the two groups tended to become larger with each successive tryout.

In 1978, the President of the Republic appointed an external commission to conduct an independent evaluation study of the new E-M program. This group assessed student and teacher attitudes toward the new program as well as community reaction. They also selected 18 schools with some 3500 students enrolled, and directed that the new KEDI system be implemented in these schools for five

months in six basic subject areas, and identified a group of traditional schools to serve as the control. They found that mean achievement across all of the subject areas was 24 percent higher in the experimental group than in the control group, and that 30 percent more of the experimental students achieved subject mastery. Another finding was that experimental students in rural schools--rural students were usually well-behind urban students in achievement--performed as well as students enrolled in city schools. The commission recommended an orderly implementation of the new E-M program in all of Korea's schools.

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KEDI has produced a large number of research reports, monographs and position papers which have much potential use for professional educators. Many of these are available in English and may be obtained directly from KEDI.